

UNCLASSIFIED

~~SECRET~~

This Document Contains 6

INTER-OFFICE MEMORANDUM

~~CONFIDENTIAL~~

No. of Pages. Copy 10 of 10
Copies.

DATE July 14, 1944

TO: Members of Initiator Committee

FROM: K. T. Bainbridge

SAA200067180000

SUBJECT: Minutes of Meeting of July 6, held in Room B-212.

Present: Members of Committee and R. Oppenheimer, A. Ayers, G. Farwell.

JAN 29 1981

A-83-013
3-26

I.

The committee should soon arrive at a final design for the initiator and all of the following factors are important.

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW
1. DETERMINATION (CIRCLE NUMBER): 1. CLASSIFICATION RETAINED 2. CLASSIFICATION CHANGED TO: 3. CONTAINS NO DOE CLASSIFIED INFO 4. COORDINATE WITH: 5. CLASSIFICATION CANCELLED 6. CLASSIFIED INFO BRACKETED 7. OTHER (SPECIFY):
1ST REVIEW DATE: 3/2/96
AUTHORITY: OAC, OAD, OADDO
NAME: [Signature]
2ND REVIEW DATE: 3/26/96
AUTHORITY: [Signature]
NAME: [Signature]

II. Mr. Dodson presented his results on neutron background measurement. This is attached as Appendix A.

Improvements in the purification on Monsanto Po can be anticipated. The material shipped has not yet made the 50% by weight of Po requirement. The delivery schedule as of April 12 - 14, 1944 is being held to. This report is included in Appendix B.

III. Absolute Measurements.

UNCLASSIFIED

Classification changed to: Segre discussed the procedure followed in making the absolute measurements

CONFIDENTIAL RD

~~CONFIDENTIAL~~

1st reviewer signature/initials/org./date/initials

2nd reviewer signature/initials/org./date/initials

~~SECRET~~

~~SECRET~~

INTER-OFFICE MEMORANDUM

~~CONFIDENTIAL~~

DATE

TO:

FROM:

SUBJECT:

UNCLASSIFIED

of initiator strength. A discussion of the method and a summary of the measurement is included in a report by George Farwell, attached as Appendix C. b

It is possible that the absorption in the stronger source might change the spectral distribution by an appreciable amount. In the implosion case the strength of source must be known accurately and an accuracy of 10% was suggested.

IV.

His report was circulated prior to the meeting, to members of the Initiator Committee.

b) Critchfield also reported on Safety Provision for the 20 mm Range, a copy of Breslow's report on Safety Provisions was distributed to members of the committee prior to the meeting and to Dr. Hempleman and Mr. Wood.

Critchfield inquired about the possibility of firing active shots on the 3" scale at Anchor.

McMillan suggested that the ground around the 20 mm should be inspected to get some idea of the strength of Po which had deposited there and its removal by rain. b3

A recommendation was put as a motion by Critchfield that all gun assembly large scale prototype targets should include initiators or dummy initiators for test. The final vote was: McMillan against the recommendation, Bainbridge and Critchfield voted for it, Segre and Dodson did not vote, Bacher and Parsons were absent.

The main argument against incorporating initiators in prototype or dummy targets was that the target results would not mean anything if two variables are involved. The main arguments for incorporation of initiators were

UNCLASSIFIED

~~CONFIDENTIAL~~

~~SECRET~~

UNCLASSIFIED

Po Delivery Schedule

As of April 12-14, 1944.

~~CONFIDENTIAL~~

<u>Month</u>	<u>Scheduled Minimum</u>	<u>Amount Sent, Monsanto Assay</u>	<u>Amount Rec'd. Our Assay</u>
March		0.94 c	0.62 c.
April	2.5 curies	2.39 c.	2.05 c.
May	2.5 curies	2.6 c.	2.36 c.
June	2.5 curies	3.1 c.	2.76 c.
July	6 curies		
August	6 curies		
September	10 curies		

10 c./month as soon as W operates.

20 c. held in reserve in B1 for spot delivery on request.

~~CONFIDENTIAL~~

UNCLASSIFIED

2240-1353

UNCLASSIFIED

APPENDIX C

NEUTRON YIELDS OF INITIATOR ASSEMBLIES FIRED TO 7/4/44

by G. Farwell

~~CONFIDENTIAL~~

Eleven active gun assemblies designed by Ayers have been fired by the E-4 20 mm testing crew with the assistance of E. Nooker, the neutron emission of each assembly has been measured, after hand assembly where possible and after gun assembly in every case.

Determination of absolute neutron yields is based upon comparison of the active assemblies with a Po-Be standard calibrated by Graves. Results are estimated to be accurate to $\pm 5\%$. The comparisons are made with a BF_3 detector. An 8% correction is made for absorption by the walls of the target-assemblies.

Differences in target design have no measurable effect on the magnitude of the correction.

Efficiencies are estimated from the measured neutron yields and the activities of the Po foils as measured by Dodson. 100% efficiency is defined as the emission of 2500 neutrons per second per millicurie of Po (cf Roberts, CF 864) and assumed 4 π contact of Po and Be.

Target Description	Gun Ass'y Yield	Total neutrons	Millicuries	Neutrons	Efficie
	Hand ass'y yield	per second	Po	per sec.	%
		(Gun ass'y)	(at date of firing)	mc Po	

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW
USE RE: DATE 3/2/96
AUTHORITY: 38 CFR 1.562
NAME: E. Nooker
DATE: 3/2/96
REASON: 1.562
APPROVAL: [Signature]
DATE: 3/2/96
REASON: 1.562
APPROVAL: [Signature]

22401354

UNCLASSIFIED

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

AB20008690000

Unique Document #
THE WHITE HOUSE

WASHINGTON

August 22, 1958

~~CONFIDENTIAL~~

Dear Dr. Bradbury:

I am today announcing that the United States will suspend nuclear weapons tests for a period of twelve months and, under certain conditions of progress toward real disarmament, continue that suspension on a year-to-year basis.

It will, of course, require an extended period to negotiate and install a genuine and assured disarmament arrangement. Even though we will not be doing any weapons testing, it will be necessary that we maintain our weapons development progress during the period and with no less urgency than in the past. It is necessary, in the interest of our country's defense, that the staff of your laboratory, and that of the other weapons development laboratories, continue their research and development in this field with their current vigor and devotion.

I am instructing the Atomic Energy Commission to develop plans to see that these essentials are met and that the vitality of our laboratories is maintained.

Sincerely,

Dwight D. Eisenhower

Dr. Norris Bradbury
Director
Los Alamos Laboratory
Los Alamos
New Mexico

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW	
1ST REVIEW DATE: 11/15/95	DETERMINATION (CIRCLE NUMBER(S))
AUTHORITY: E.O. 12958, ADD	1. CLASSIFICATION RETAINED
NAME: <i>NRB/Smith</i>	2. CLASSIFICATION CHANGED TO:
2ND REVIEW DATE: 11-15-95	3. CONTAINS NO DOE CLASSIFIED INFO
AUTHORITY: ADD	4. COORDINATE WITH:
NAME: <i>100/4th</i>	5. CLASSIFICATION CANCELLED
	6. CLASSIFIED INFO BRACKETED
	7. OTHER (SPECIFY):

UNAUTHORIZED DISCLOSURE SUBJECT TO ADMINISTRATIVE AND CRIMINAL ACTIONS.

COPIED/DOE
LANL RC

100/4th

~~SECRET~~

May 29, 1958

hand technical competence, and it appears to us to also be a field with great uncertainty. Any comparison of long term genetic effects with short term pathologic effects is bound to be, at this time, rather arbitrary and subject to varying interpretation. This is not only because damage produced per unit of radiation is quite uncertain but also because genetic and pathologic damage manifest themselves very differently. To consider mutations as genetic casualties may be sound statistical genetic theory; it may also be sound morality and propaganda. However, it is not clear that it is meaningful to compare long term genetic casualties with other casualties as involving equal human suffering or burden to society.

" C^{14} can only look like a major hazard if one considers genetic damage which will be produced over thousands of years. For some purposes, casualty rates, or probability of death per individual are more meaningful than total number of casualties. In a comparison of casualty rates, C^{14} damage which extends over several hundred generations, would appear relatively less hazardous than pathologic damage by this factor of several hundred.

"Further, uncertainty is found in interpreting Cs^{137} data in terms of long term genetic damage. Leipunsky assumes that reported Cs^{137} is in equilibrium with soil K and computes a serious hazard. It appears to us that the reported Cs^{137} comes mostly from direct fallout and thus that Leipunsky's computation of Cs^{137} hazard is too high. However, the exact extent of the Cs^{137} hazard is not yet clear.

"Bearing the above general remarks in mind, a number of comments are required:

"(1) Leipunsky compares pure fission and pure D,T devices. The same comparison will not hold as between current U. S. standard and clean thermonuclear devices.

DOE
b(2)

~~SECRET~~

~~SECRET~~

Brig. General A. B. Starbird

-4-

May 29, 1958

Doc
b(3)

"(2) However, it appears probable that Leipunsky has substantially overestimated the damage due to Cs^{137} and somewhat overestimated the damage due to Sr^{90} . The Cs^{137} overestimate arises because Leipunsky assumed that Cs^{137} , which has been found in people is in equilibrium with K (similar to the way in which Sr^{90} and Ca are related). He thus concludes that Cs^{137} levels in people will persist for a long time (about 40 years). It seems more reasonable that most of the Cs^{137} now in people came directly from fallout and that it will disappear fairly rapidly, as it is eliminated with a biological half life of approximately 140 days.

"(3) Therefore, it cannot be concluded that for even a standard two-stage device the long term genetic casualties produced by C^{14} and H^3 may not exceed or equal genetic and leukemia casualties produced by long-lived fission products (Cs^{137} and Sr^{90}). The conclusion here depends largely on how one defines a genetic casualty and how one treats the Cs^{137} hazard. Leipunsky could have obtained a factor ten more mutants (genetic casualties) by considering U.S. figures on all deleterious mutations. These considerations are discussed in T-1026.

"(4) C^{14} can be a major source of world-wide casualties if and only if one counts the long term genetic casualties--which may not be produced or show up until thousands of years after the C^{14} was produced. If one is willing to consider long term, genetic casualties as a legitimate hazard, it should also be noted that the highly irradiated survivors of local fallout will in themselves constitute a potential world-wide genetic hazard. It appears that for a war with yield $\lesssim 10^5$ megatons (and with about half the detonations as surface bursts on typical ground) the long term genetic casualties produced by local fallout will exceed those due to C^{14} . Thus if one chooses to emphasize genetic hazards, it appears likely that a wartime weapon will produce long term genetic damage which is roughly proportional

~~SECRET~~

~~SECRET~~

Brig. General A. D. Starbird

-3-

May 29, 1958

to the total radiation received by survivors of local fallout.

DOE
b(3)

"(5) Long term genetic hazards do not look like a very serious wartime consideration to us. However, since genetic damage may manifest itself over thousands of years, it has the pronounced characteristic that many casualties may be produced while the hazard to any one individual is very small. Thus, for example, one night (with numbers of T-1026) by detonation of 2×10^5 megatons produce sufficient C^{14} to induce about 10^8 inherited human mutations and thus about 10^8 'genetic casualties.' However, these would appear over hundreds of generations and might, in fact, be completely undetectable. For some purposes the casualty rate, say in individuals per generation, may be more meaningful than the total number of casualties. To obtain a casualty rate for C^{14} in individuals per generation one must divide the total calculated C^{14} casualties by like 200 since the damage will extend over like 200 generations. "

Yours sincerely,

Barol Froman

BF:rb

Encs: T-1026, cy 2A
T-1009, cy 2RD

Distribution:

- 1A - Brig. Gen. A. D. Starbird, w/encs.
- 2A - George Bell, w/o encs.
- 3A - TAD Files, w/o encs.
- 4A, 5A - Central Records, w/o encs.

~~SECRET~~